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Airworthiness Directives

X-REF AD

► **Federal Register Information**▼ **Header Information**

DEPARTMENT OF TRANSPORTATION

Federal Aviation Administration

14 CFR Part 39 [65 FR 10695 2/29/2000]

Docket No. 99-NM-366-AD; Amendment 39-11600; AD 2000-04-17

RIN 2120-AA64

Airworthiness Directives; Boeing Model 747-100, -200, and -300 Series Airplanes
PDF Copy (If Available):

▼ **Preamble Information**

AGENCY: Federal Aviation Administration, DOT

ACTION: Final rule; request for comments

SUMMARY: This amendment adopts a new airworthiness directive (AD) that is applicable to certain Boeing Model 747-100, -200, and -300 series airplanes. This action requires repetitive inspections to detect fatigue cracking in the upper deck floor beams located at certain body stations, and repair, if necessary. This amendment is prompted by a report by the manufacturer that, during a fatigue test, the upper chord and web of the upper deck floor beams located at body stations (BS) 340 and 360 were found severed at approximately 34,000 total flight cycles. Another report by an operator indicated that a severed upper chord and web were found in the upper deck floor beam at BS 380 at approximately 33,000 total flight cycles. In addition, cracking was found at multiple fastener hole locations. The actions specified in this AD are intended to prevent failure of the upper deck floor beams at certain body stations due to fatigue cracking, which could result in rapid decompression and consequent reduced controllability of the airplane.

DATES: Effective March 15, 2000.

The incorporation by reference of certain publications listed in the regulations is approved by the

Director of the Federal Register as of March 15, 2000.

Comments for inclusion in the Rules Docket must be received on or before May 1, 2000.

ADDRESSES: Submit comments in triplicate to the Federal Aviation Administration (FAA), Transport Airplane Directorate, ANM-114, Attention: Rules Docket No. **99-NM-366-AD**, 1601 Lind Avenue, SW., Renton, Washington 98055-4056.

The service information referenced in this AD may be obtained from Boeing Commercial Airplane Group, P.O. Box 3707, Seattle, Washington 98124-2207. This information may be examined at the FAA, Transport Airplane Directorate, 1601 Lind Avenue, SW., Renton, Washington; or at the Office of the Federal Register, 800 North Capitol Street, NW., suite 700, Washington, DC.

FOR FURTHER INFORMATION CONTACT: Rick Kawaguchi, Aerospace Engineer, Airframe Branch, ANM-120S, FAA, Transport Airplane Directorate, Seattle Aircraft Certification Office, 1601 Lind Avenue, SW., Renton, Washington 98055-4056; telephone (425) 227-1153; fax (425) 227-1181.

SUPPLEMENTARY INFORMATION: The FAA has received a report indicating that, during a Boeing fatigue test, the upper chord and web of the upper deck floor beams located at body stations (BS) 340 and 360 failed at approximately 34,000 flight cycles. The FAA also received an operator's report of a severed upper chord and web at BS 380, which occurred in an upper deck floor beam at approximately 33,000 flight cycles. In addition, cracks were found at twelve floor panel attachment fastener holes between left buttock line 66.5 and right buttock line 58.5.

The manufacturer also reports that one operator found crack indications at multiple fastener hole locations during an inspection of the upper deck floor beams located at BS 340 and 360 on six airplanes having at least 30,000 total flight cycles. Inspections included an open-hole high frequency eddy current (HFEC) inspection from above, and a visual inspection from below. The majority of the cracks were found during open-hole HFEC inspections, and most of such cracking could be removed by oversizing the fastener holes; however, repairs were required at some locations.

The report also indicates that the floor beams at BS 340 and 360 are made from 7075 aluminum, a material which is more susceptible to fatigue cracking than 2024 aluminum. The floor beam at BS 380 is made from 2024 aluminum, which is considered a more durable material than 7075 aluminum; however, recent reports of cracking at that body station indicate that it is necessary to also require inspections in that area.

The FAA has been informed that flight-critical wire bundles and control cables are routed through the upper deck floor beams at BS 340, 360, and 380; and that failure of these floor beams could lead to large deflection or deformation of the floor and body skin, frames, and stringers, which could damage the wire bundles and result in unintended inputs to the flight control cables. Failure of the upper deck floor beams at BS 340, 360, and 380, due to fatigue cracking, could also result in rapid decompression and consequent reduced controllability of the airplane.

Explanation of Relevant Service Information

The FAA has reviewed and approved Boeing Alert Service Bulletin 747-53A2431, dated February 10, 2000, which describes procedures for repetitive open-hole high frequency eddy current (HFEC) and surface HFEC inspections to detect cracking of the upper chords of the upper deck floor beams at BS

340 and 360; and repair, if necessary. Procedures also include repetitive inspections if no cracking is found. The first repetitive inspection threshold may be extended from 3,000 flight cycles to 10,000 flight cycles if the floor panel attachment fastener holes are modified.

Explanation of the Requirements of the Rule

Since an unsafe condition has been identified that is likely to exist or develop on other Boeing Model 747-100, -200, and -300 series airplanes of the same type design, this AD is being issued to prevent failure of the upper deck floor beams at BS 340, 360, and 380 due to fatigue cracking that originates from the upper chord fastener holes of those floor beams, which could result in rapid decompression and consequent reduced controllability of the airplane. This AD requires accomplishment of actions specified in the alert service bulletin described previously, except as discussed below.

Differences Between the Alert Service Bulletin and This AD

Operators should note that, although the alert service bulletin specifies inspections of the upper chord of the upper deck floor beam at BS 340 and 360, the FAA has determined that the same unsafe condition also exists on both the left and right sides of the floor beam at BS 380 between buttock lines 40 and 76. This determination is based on a recent report from an operator that a severed upper chord and web were found in an upper deck floor beam at BS 380.

Operators also should note that, although the alert service bulletin specifies that the manufacturer may be contacted for disposition of certain repair conditions, this AD requires the repair of those conditions to be accomplished in accordance with a method approved by the FAA, or in accordance with data meeting the type certification basis of the airplane approved by a Boeing Company Designated Engineering Representative who has been authorized by the FAA to make such findings.

Determination of Rule's Effective Date

Since a situation exists that requires the immediate adoption of this regulation, it is found that notice and opportunity for prior public comment hereon are impracticable, and that good cause exists for making this amendment effective in less than 30 days.

Comments Invited

Although this action is in the form of a final rule that involves requirements affecting flight safety and, thus, was not preceded by notice and an opportunity for public comment, comments are invited on this rule. Interested persons are invited to comment on this rule by submitting such written data, views, or arguments as they may desire. Communications shall identify the Rules Docket number and be submitted in triplicate to the address specified under the caption "ADDRESSES." All communications received on or before the closing date for comments will be considered, and this rule may be amended in light of the comments received. Factual information that supports the commenter's ideas and suggestions is extremely helpful in evaluating the effectiveness of the AD action and determining whether additional rulemaking action would be needed.

Comments are specifically invited on the overall regulatory, economic, environmental, and energy aspects of the rule that might suggest a need to modify the rule. All comments submitted will be available, both before and after the closing date for comments, in the Rules Docket for examination by interested persons. A report that summarizes each FAA-public contact concerned with the substance of this AD will be filed in the Rules Docket.

Commenters wishing the FAA to acknowledge receipt of their comments submitted in response to this rule must submit a self-addressed, stamped postcard on which the following statement is made: "Comments to Docket Number 99-NM-366-AD." The postcard will be date stamped and returned to the commenter.

The regulations adopted herein will not have a substantial direct effect on the States, on the relationship between the national Government and the States, or on the distribution of power and responsibilities among the various levels of government. Therefore, it is determined that this final rule does not have federalism implications under Executive Order 13132.

The FAA has determined that this regulation is an emergency regulation that must be issued immediately to correct an unsafe condition in aircraft, and that it is not a "significant regulatory action" under Executive Order 12866. It has been determined further that this action involves an emergency regulation under DOT Regulatory Policies and Procedures (44 FR 11034, February 26, 1979). If it is determined that this emergency regulation otherwise would be significant under DOT Regulatory Policies and Procedures, a final regulatory evaluation will be prepared and placed in the Rules Docket. A copy of it, if filed, may be obtained from the Rules Docket at the location provided under the caption "ADDRESSES."

List of Subjects in 14 CFR Part 39

Air transportation, Aircraft, Aviation safety, Incorporation by reference, Safety.

Adoption of the Amendment

Accordingly, pursuant to the authority delegated to me by the Administrator, the Federal Aviation Administration amends part 39 of the Federal Aviation Regulations (14 CFR part 39) as follows:

PART 39 - AIRWORTHINESS DIRECTIVES

1. The authority citation for part 39 continues to read as follows: Authority: 49 U.S.C. 106(g), 40113, 44701.
- § 39.13 [Amended]
2. Section 39.13 is amended by adding the following new airworthiness directive:

▼ Regulatory Information

2000-04-17 BOEING: Amendment 39-11600. Docket 99-NM-366-AD.

Applicability: Model 747-100, -200, and -300 series airplanes as listed in Boeing Alert Service Bulletin 747-53A2431; certificated in any category.

NOTE 1: This AD applies to each airplane identified in the preceding applicability provision, regardless of whether it has been modified, altered, or repaired in the area subject to the requirements of this AD. For airplanes that have been modified, altered, or repaired so that the performance of the requirements of this AD is affected, the owner/operator must request approval for an alternative method of compliance in accordance with paragraph (b) of this AD. The request should include an assessment of the effect of the modification, alteration, or repair on the unsafe condition addressed by this AD; and, if the unsafe condition has not been eliminated, the request should include specific proposed actions to address it.

Compliance: Required as indicated, unless accomplished previously.

NOTE 2: The actions specified by Boeing Alert Service Bulletin 747-53A2431, dated February 10, 2000, for the upper deck floor beams located at body stations (BS) 340 and 360, also are applicable to both the left and right sides of the floor beam at BS 380 between buttock lines (BL) 40 and 76.

To prevent failure of the upper deck floor beams due to fatigue cracking at BS 340, 360, and 380; which could result in rapid decompression and consequent reduced controllability of the airplane; accomplish the following:

Inspections and Repair

(a) Prior to the accumulation of 28,000 total flight cycles, or within 60 days after the effective date of this AD, whichever occurs later, perform the inspections required by either paragraph (a)(1) or (a)(2) of this AD, as applicable.

(1) Gain access to the upper deck floor beams from above the upper deck floor, and perform an open-hole high frequency eddy current (HFEC) inspection to detect cracking of the upper deck floor beams at BS 340 and 360, and on both the left and right sides of the floor beam at BS 380 between BL 40 and 76; in accordance with Part 1 of the Accomplishment Instructions of Boeing Alert Service Bulletin 747-53A2431, dated February 10, 2000.

(i) If no cracking is found, perform the actions required by either paragraph (a)(1)(i)(A) or (a)(1)(i)(B) of this AD, in accordance with the alert service bulletin.

(A) Repeat the inspection required by paragraph (a)(1) of this AD thereafter at intervals not to exceed 3,000 flight cycles.

(B) Modify (oversize) the floor panel attachment fastener holes as specified in Figure 5 of the alert service bulletin, and repeat the inspection required by paragraph (a)(1) of this AD within 10,000 flight cycles. Thereafter, repeat the inspection at intervals not to exceed 3,000 flight cycles.

(ii) If any cracking is found, prior to further flight, repair in accordance with a method approved by the Manager, Seattle Aircraft Certification Office (ACO), FAA, Transport Airplane Directorate; or in accordance with data meeting the type certification basis of the airplane approved by a Boeing Company Designated Engineering Representative (DER) who has been authorized by the FAA to make such findings. For a repair method to be approved by the Manager, Seattle ACO, as required by this paragraph, the Manager's approval letter must specifically reference this AD.

(2) Gain access to the upper deck floor beams from below the upper deck floor; modify the floor panel attachment clipnuts at BS 340 and 360, and on both the left and right sides of the floor beam at BS 380 between BL 40 and 76; and perform a surface HFEC inspection to detect cracking of the floor beams at those body stations; in accordance with Part 2 of the Accomplishment Instructions of Boeing Alert Service Bulletin 747-53A2431, dated February 10, 2000.

(i) If no cracking is found, repeat the inspection required by paragraph (a)(2) of this AD thereafter at intervals not to exceed 750 flight cycles.

(ii) If any cracking is found, prior to further flight, repair in accordance with a method approved by the Manager, Seattle ACO, or in accordance with data meeting the type certification basis of the airplane approved by a Boeing Company DER who has been authorized by the FAA to make such findings. For a repair method to be approved by the Manager, Seattle ACO, as required by this paragraph, the

Manager's approval letter must specifically reference this AD.

Alternative Methods of Compliance

(b) (1) An alternative method of compliance or adjustment of the compliance time that provides an acceptable level of safety may be used if approved by the Manager, Seattle ACO. Operators shall submit their requests through an appropriate FAA Principal Maintenance Inspector, who may add comments and then send it to the Manager, Seattle ACO.

(2) An alternative method of compliance for paragraphs (a)(1)(ii) and (a)(2)(ii) of this AD that provides an acceptable level of safety may be used in accordance with data meeting the type certification basis of the airplane approved by a Boeing Company DER who has been authorized by the Manager, Seattle ACO, to make such findings.

NOTE 3: Information concerning the existence of approved alternative methods of compliance with this AD, if any, may be obtained from the Seattle ACO.

Special Flight Permits

(c) Special flight permits may be issued in accordance with sections 21.197 and 21.199 of the Federal Aviation Regulations (14 CFR 21.197 and 21.199) to operate the airplane to a location where the requirements of this AD can be accomplished.

Incorporation by Reference

(d) Except as specified in paragraphs (a)(1)(ii) and (a)(2)(ii), the actions shall be done in accordance with Boeing Alert Service Bulletin 747-53A2431, dated February 10, 2000. This incorporation by reference was approved by the Director of the Federal Register in accordance with 5 U.S.C. 552(a) and 1 CFR part 51. Copies may be obtained from Boeing Commercial Airplane Group, P.O. Box 3707, Seattle, Washington 98124-2207. Copies may be inspected at the FAA, Transport Airplane Directorate, 1601 Lind Avenue, SW., Renton, Washington; or at the Office of the Federal Register, 800 North Capitol Street, NW., suite 700, Washington, DC.

(e) This amendment becomes effective on March 15, 2000.

▼ Footer Information

Issued in Renton, Washington, on February 22, 2000.
Donald L. Riggin,
Acting Manager, Transport Airplane Directorate,
Aircraft Certification Service.

▼ Service Bulletin Information

Service Bulletin for the Web:

► Comments